

Release notes for ENDF/B Development n-096_Cm_242
evaluation

ENDF
B-VII.**dev**

April 26, 2017

- fudge-4.0 Warnings:

1. Missing a channel with a particular angular momenta combination
resonances / resolved / MultiLevelBreitWigner (Error # 0): missingResonanceChannel

WARNING: Missing a channel with angular momenta combination L = 0, J = 1.5 and S = 1.5 for "capture"

2. Potential scattering hasn't converted, you need more L's!
resonances / resolved (Error # 1): potentialScatteringNotConverged

WARNING: Potential scattering hasn't converged by L=0 at E=275.0 eV, xs[0]/xs[0]=100.0% > 0.1%

3. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 0: total (Error # 0): CS Sum.

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.45%

4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 1 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [nubar]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (total): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (total): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

7. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 4 (n + Cm242): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

8. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 4 (n + Cm242): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

9. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 8 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission]): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

10. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 8 (n [multiplicity:'energyDependent', emissionMode:'prompt'] + n [emissionMode:'6 delayed'] + γ [total fission]): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

11. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 9 (n + (Cm242_e1 -> Cm242 + γ)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (3.130617e-10) is too small

12. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 10 (n + (Cm242_e2 -> Cm242 + γ)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (7.050160e-09) is too small

13. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 11 (n + (Cm242_e3 -> Cm242 + γ)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (5.942669e-09) is too small

14. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 12 (n + (Cm242_c -> Cm242 + γ)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

15. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 13 (Cm243 + γ): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

16. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 13 (Cm243 + γ): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

17. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 14 (n + Cm242 [angular distribution]): / Form 'eval': (Error # 1): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

18. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 15 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

19. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 16 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

20. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 17 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

21. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 18 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

22. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 19 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

23. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 20 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

24. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 21 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'6 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

• fudge-4.0 Errors:

1. Energy range of data set does not match cross section range
reaction label 4: $n + (Cm242_c \rightarrow Cm242 + \gamma) / Product: Cm242_c / Decay product: \gamma_a / Multiplicity: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (170000.0 -> 2000000.0) vs (110000.0 -> 2000000.0)

2. Energy range of data set does not match cross section range
reaction label 4: $n + (Cm242_c \rightarrow Cm242 + \gamma) / Product: Cm242_c / Distribution: / uncorrelated - angular - isotropic: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (170000.0 -> 2000000.0) vs (110000.0 -> 2000000.0)

WARNING: Domain doesn't match the cross section domain: (250000.0 -> 2000000.0) vs (110000.0 -> 2000000.0)

WARNING: Domain doesn't match the cross section domain: (400000.0 -> 2000000.0) vs (110000.0 -> 2000000.0)

3. Energy range of data set does not match cross section range
reaction label 4: $n + (Cm242_c \rightarrow Cm242 + \gamma) / Product: Cm242_c / Decay product: \gamma_b / Multiplicity: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (250000.0 -> 2000000.0) vs (110000.0 -> 2000000.0)

4. Energy range of data set does not match cross section range
reaction label 4: $n + (Cm242_c \rightarrow Cm242 + \gamma) / Product: Cm242_c / Decay product: \gamma_c / Multiplicity: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (400000.0 -> 2000000.0) vs (110000.0 -> 2000000.0)

5. Calculated and tabulated Q values disagree.
reaction label 5: $n[multiplicity: '2'] + Cm241 + \gamma (Error \# 0): Q mismatch$

WARNING: Calculated and tabulated Q-values disagree: -7377528.209655762 eV vs -6969520. eV!

6. Energy range of data set does not match cross section range
reaction label 5: $n[multiplicity: '2'] + Cm241 + \gamma / Product: \gamma_a / Multiplicity: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

7. Energy range of data set does not match cross section range
reaction label 5: $n[multiplicity: '2'] + Cm241 + \gamma / Product: \gamma_a / Distribution: / uncorrelated - angular - isotropic: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

8. Energy range of data set does not match cross section range
reaction label 5: $n[multiplicity: '2'] + Cm241 + \gamma / Product: \gamma_b / Multiplicity: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

9. Energy range of data set does not match cross section range
reaction label 5: $n[multiplicity: '2'] + Cm241 + \gamma / Product: \gamma_b / Distribution: / uncorrelated - angular - isotropic: (Error \# 0): Domain mismatch (a)$

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

10. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_c / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

11. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_c / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

12. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_d / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

13. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_d / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

14. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_e / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

15. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_e / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

16. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_f / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

17. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_f / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

18. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_g / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

19. Energy range of data set does not match cross section range
reaction label 5: n[multiplicity:'2'] + Cm241 + gamma / Product: gamma_g / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (7500000.0 -> 20000000.0) vs (6998570.0 -> 20000000.0)

20. Calculated and tabulated Q values disagree.
reaction label 6: n[multiplicity:'3'] + Cm240 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -13470853.42709351 eV vs -1.30628e7 eV!

21. Energy range of data set does not match cross section range
reaction label 6: n[multiplicity:'3'] + Cm240 + gamma / Product: gamma_a / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (14000000.0 -> 20000000.0) vs (13117300.0 -> 20000000.0)

22. Energy range of data set does not match cross section range
reaction label 6: n[multiplicity:'3'] + Cm240 + gamma / Product: gamma_a / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (14000000.0 -> 20000000.0) vs (13117300.0 -> 20000000.0)

23. Calculated and tabulated Q values disagree.
reaction label 8: Cm243 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 5284939.630889893 eV vs 5692940. eV!

24. Multiplicity does not match sum of linked product multiplicities!
multiplicitySum label 6: n + (Cm242.c -> Cm242 + gamma) total gamma multiplicity (Error # 0): summedMultiplicityMismatch

WARNING: Multiplicity does not match sum of linked product multiplicities! Max diff: 40.81%

25. Multiplicity does not match sum of linked product multiplicities!
multiplicitySum label 7: n[multiplicity:'2'] + Cm241 + gamma total gamma multiplicity (Error # 0): summedMultiplicityMismatch

WARNING: Multiplicity does not match sum of linked product multiplicities! Max diff: 93.45%

26. Multiplicity does not match sum of linked product multiplicities!
multiplicitySum label 8: n[multiplicity:'3'] + Cm240 + gamma total gamma multiplicity (Error # 0): summedMultiplicityMismatch

WARNING: Multiplicity does not match sum of linked product multiplicities! Max diff: 81.32%

27. Calculated and tabulated Q values disagree.
fissionComponent label 0: /reactionSuite/fissionComponents/fissionComponent[@label='0'] (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 226415521951.9315 eV vs 2.03461e8 eV!

28. Calculated and tabulated Q values disagree.
fissionComponent label 1: /reactionSuite/fissionComponents/fissionComponent[@label='1'] (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 226415521951.9315 eV vs 2.03461e8 eV!

29. Calculated and tabulated Q values disagree.
fissionComponent label 2: /reactionSuite/fissionComponents/fissionComponent[@label='2']
(Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 226415521951.9315 eV vs 2.03461e8 eV!

30. Calculated and tabulated Q values disagree.
fissionComponent label 3: /reactionSuite/fissionComponents/fissionComponent[@label='3']
(Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 226415521951.9315 eV vs 2.03461e8 eV!

31. A covariance matrix was not positive semi-definite, so it has negative eigenvalues.
Section 14 (n + Cm242 [angular distribution]): / Form 'eval': / LegendreLValue L=1 vs 1 (Error # 0): Bad evs

WARNING: 10 negative eigenvalues! Worst case = -2.148538e-04

• njoy2012 Warnings:

1. In some evaluations, the partial fission reactions MT=19, 20, 21, and 38 are given in File 3, but no corresponding distributions are given. In these cases, it is assumed that MT=18 should be used for the fission neutron distributions.
heatr...prompt kerma (0): HEATR/hinit (3)

---message from hinit---mt19 has no spectrum
mt18 spectrum will be used.

2. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (1): HEATR/hinit (4)

---message from hinit---mf6, mt 16 does not give recoil za= 96241
one-particle recoil approx. used.

3. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (2): HEATR/hinit (4)

---message from hinit---mf6, mt 17 does not give recoil za= 96240
one-particle recoil approx. used.

4. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (3): HEATR/hinit (4)

---message from hinit---mf6, mt 51 does not give recoil za= 96242
one-particle recoil approx. used.

5. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (4): HEATR/hinit (4)

---message from hinit---mf6, mt 52 does not give recoil za= 96242
one-particle recoil approx. used.

6. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (5): HEATR/hinit (4)

---message from hinit---mf6, mt 53 does not give recoil za= 96242
one-particle recoil approx. used.

7. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (6): HEATR/hinit (4)

---message from hinit---mf6, mt 91 does not give recoil za= 96242
one-particle recoil approx. used.

8. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (7): HEATR/hinit (4)

---message from hinit---mf6, mt102 does not give recoil za= 96243
photon momentum recoil used.

9. There is a problem with the fission energy release.
heatr...prompt kerma (8): HEATR/nheat (3)

---message from nheat---changed q from 2.034610E+08 to 1.958220E+08
for mt 18